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Conference Abstract

GeoPick: Georeferencing Made Easy

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Abstract

GeoPick is a new web application aimed at providing a simple yet powerful georeferencing tool to the natural history collections community (Fig. 1). Its conceptual foundation is based on the Georeferencing Best Practices by Chapman and Wieczorek (2020), whose guidelines it intends to implement. GeoPick also provides a close and direct relation between the tool's output and the Darwin Core standard (Wieczorek et al. 2012). In the past two decades, institutions across the world have devoted significant resources to digitise their collections and bring them closer to their final users (Nelson and Ellis 2018), i.e., the research, conservation and education communities, and to the general public.

Georeferencing is an important part of the digitisation process (Nelson et al. 2012). It provides the link between the preserved specimen and the natural habitat where it lived (Bloom et al. 2017). However, there is a gap between the data that have already been digitised and made accessible through public repositories such as the Global Biodiversity Information Facility (GBIF) and the expected fully georeferenced information, including crucial information on coordinate uncertainty and precision, which is needed to conduct rigorous studies based upon digitised specimens (Marcer et al. 2022).

In order to determine the reasons behind this mismatch between optimal and actual georeferenced data, we conducted a global survey on current georeferencing practices (Marcer et al. 2021a), which was used as the basis for discussion in a workshop organised by the MOBILISE Cost Action that took place in Warsaw (Poland) in 2020 (Marcer et al. 2020, Marcer et al. 2021a). Among other recommendations that came out of the workshop

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was the need to develop more user-friendly tools that help georeferencers follow standards and guidelines in a more effective way. According to the survey, only 16 percent of respondents used a specific georeferencing tool such as GeoLocate (Rios 2019), while the rest only used general tools (Google Maps/Earth was reported by 47% of the respondents). Moreover, about 75% of the respondents reported only following in-house *ad hoc* protocols or none at all. This discouraging situation and the need for a tool that is easy to use, yet effective, was discussed informally with attendees at the 2022 Biodiversity Information Standards (TDWG) and Society for the Preservation of Natural History Collections (SPNHC) conferences. The current version of GeoPick is the first step towards a tool that is powerful, accessible and simple enough to help georeferencers follow standards and best practices in order to improve the data that are finally made accessible through repositories such as GBIF.

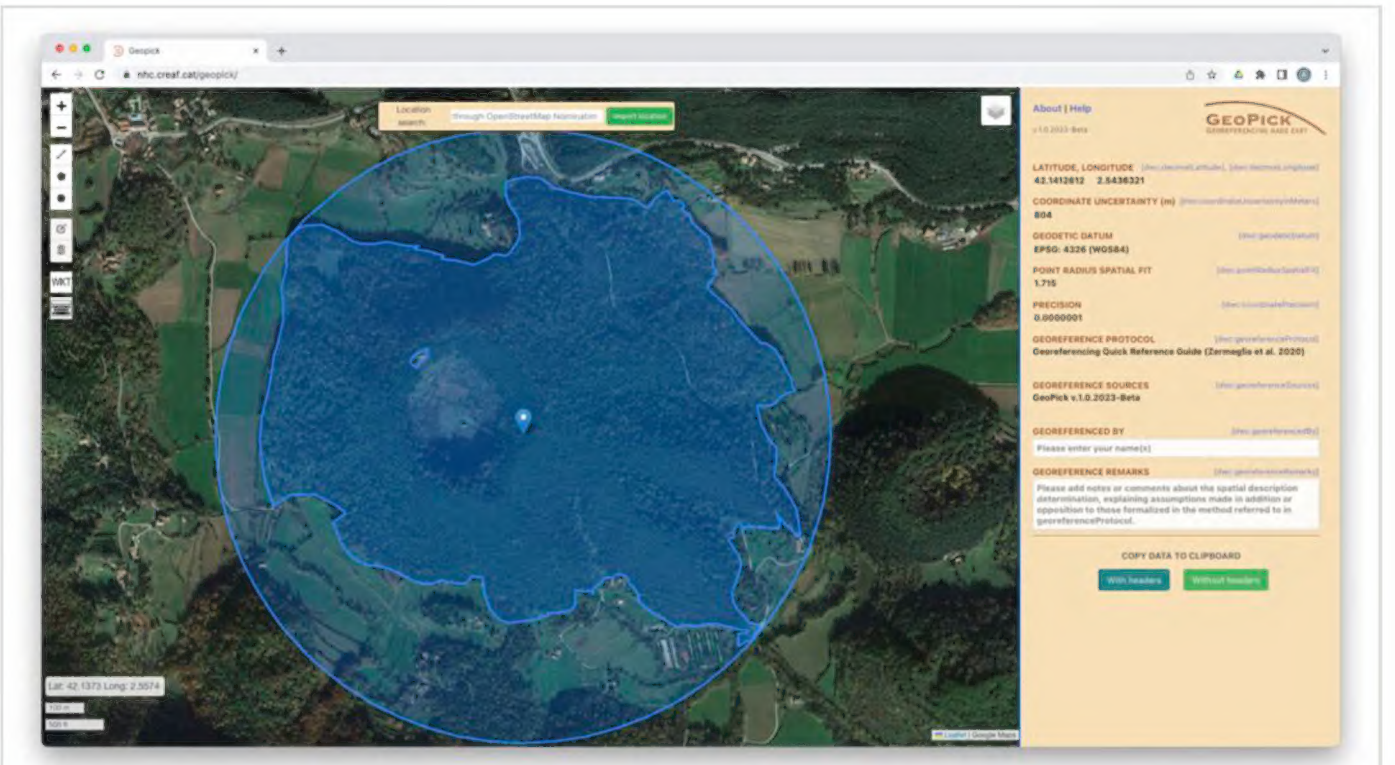

Figure 1.

GeoPick's UI. Left map panel: cartographic navigability and geometry edition (points, lines, polygons). Right info panel: display of data and metadata of the georeferenced specimen in Darwin Core format. Example shown: site 'Volcà Santa Margarida, Catalonia, Spain' with its calculated centroid and circle of uncertainty.

In this first version, GeoPick implements the point-radius (Wieczorek et al. 2004) and shape (Chapman and Wieczorek 2020) georeferencing methods. It calculates the centroid or corrected centre when necessary, the associated coordinate uncertainty, the spatial fits of the point-radius and the footprint, and provides the digitised geometry as Well-Known Text (WKT). The tool offers a map navigator with reference cartography and editing tools to digitise points, lines or polygons representing the locality description of a given location. Data are finally exported via the clipboard in Darwin Core standard format. The tool also offers search functionality for geographic features from OpenStreetMap data through the Nominatim API. The user can search and import a geometry provided by Nominatim and use it as the basis of a georeference.

Technical implementation: HTML and JavaScript browser front end that accesses a private API developed in R (R Core Team 2022). Source code availabe at GitHub.

License: GeoPick is open source with a AGPLv3 license.

Public URL: https://geopick.gbif.org (available starting October 2023)

Keywords

natural history collections, Darwin Core standard, best practices, web application, uncertainty

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Conflicts of interest

The authors have declared that no competing interests exist.

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